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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,626	02/25/2002	Kadagattur Srinidhi	PXL-042 (6573/48)	3696

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EXAMINER

CASCHERA, ANTONIO A

ART UNIT PAPER NUMBER

2676

DATE MAILED: 06/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/084,626

Applicant(s)

SRINIDHI ET AL.

Examiner

Antonio A. Caschera

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4, 5, 9, 10, 17 and 18 is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-8 and 11-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 03/11/05
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-3, 6-8 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mutoh et al. (U.S. Patent 6,631,210 B1) in view of Ng (U.S. Patent 5,502,793).

In reference to claim 1, Mutoh et al. discloses an image processing apparatus and method for discriminating between character areas and mesh areas as well as between black and white character areas with high precision (see abstract, lines 1-2 and last 5 lines). Note, the office interprets the mesh areas of Mutoh et al. equivalent to the content representing graphics of applicant's claim. Mutoh et al. discloses a second embodiment having an image area discrimination circuit comprised of multiple line memories (see #101c, 101m and 101y of Figure 18) as well as a color judgment circuit (see #102 of Figure 18) which receives a plurality of image data, in the form of pixel data, from the line memories (see column 29, lines 17-24 and 51-60). Mutoh et al. discloses a density difference sum calculation circuit which calculates an addition of the sum of absolute values of density level differences between pixels adjacent in the scanning direction within a specific area (see column 30, lines 32-37). Further, Mutoh et al. discloses utilizing adjacent pixels, centered about a target pixel, extending in vertical and horizontal directions (see column 36, lines 21-28 and Figure 30(a)) in the calculations. Note, the

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Office interprets the pixels used in the horizontal direction equivalent to, "...pixel values of adjacent pixels along the pixel line segment," as newly amended, because such pixels are aligned in the same row as the target pixel. Further, the office interprets the applicant's, "spatial gradients" equivalent to the, "density differences" of Mutoh et al. Mutoh et al. also discloses calculating a density difference average (see column 30, lines 13-23) using the density differences of a specific area. Note, the office interprets the applicant's, "smoothness index" equivalent to the, "density difference average" of Mutoh et al. because spatial connectivity of pixels is related to the gradient of an image. Mutoh et al. discloses testing the density difference average against a threshold value to produce a control signal which is later used in determining whether a black character area or an area other than a black character area is present (see column 31, lines 20-26 and columns 31-32, lines 65-13). Mutoh et al. does not explicitly disclose calculating the density difference average using density differences which are based on one or more non-linear statistical characteristics. Ng discloses detecting and enhancing image edges by calculating gradient magnitude changes of lines or text within the image (see columns 1-2, lines 65-8). Ng discloses calculating a gradient magnitude by taking the square root of the sum of the square of x and y pixel values (see column 4, lines 18-20 and 25). Note, the office interprets the "non-linear statistical characteristics" of applicant's claim equivalent to the square root of the sum of the square of x and y pixel values (see column 4, line 25 of Ng) when calculating the gradient magnitude in Ng. Further note, the office makes the above interpretation based on the applicant's remarks (see page 10 of Remarks, filed 10/1/04), wherein the applicant gives an example of using a non-linear statistic in the equation of page 10, which uses sums of square roots of pixel values. Ng further discloses using the gradient magnitude to determine whether a

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central pixel of a window of an image is black or white (see column 4, lines 59-66). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the non-linear gradient calculation techniques of Ng with the density difference, character discrimination techniques of Mutoh et al. in order to detect and enhance edge information in low resolution images using a flexible high speed system (see columns 1-2, lines 65-1 of Ng) (further see *Response to Arguments* below).

In reference to claims 2, 7 and 15, Mutoh et al. and Ng disclose all of the claim limitations as applied to claims 1, 6 and 14 respectively. Mutoh et al. discloses calculating the density difference sums by calculating the sum of absolute values of differences between target pixels and peripheral pixels (see column 9, lines 47-50 and Figures 8a and 8b).

In reference to claims 3, 8 and 16, Mutoh et al. and Ng disclose all of the claim limitations as applied to claims 1, 6 and 14 respectively. Mutoh et al. discloses calculating a density difference average (see column 30, lines 13-23) obtained from the sum of density differences and the number of density-coincident pixels (of the number of pixels that have the same density value as a target pixel) (see column 9, lines 50-56). Note, the office interprets the sum of density differences equivalent to a second statistical characteristic of density values and the number of density-coincident pixels equivalent to a first statistical characteristic of density values. Further, the office believes Mutoh et al. inherently teaches dividing the second statistical characteristic by the first to generate a smoothness index as computing an average value (density difference average) is known in mathematics to utilize a division operation.

In reference to claim 6, claim 6 is equivalent in scope to claim 1 and therefore is rejected under similar rationale in addition, Mutoh et al. discloses receiving a second plurality of pixel

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data (pixel data for color component M) from the line memories (see column 29, lines 51-60).

Mutoh et al. discloses a color feature amount extraction circuit (#121 of Figure 19) utilizing the second plurality of pixel data, along with a first and third plurality of pixel data, to produce a minimum value calculation (see columns 29-30, lines 63-12). Mutoh et al. further discloses testing the minimum value against a threshold minimum value, the result further helps in deciding whether a black character area or an area other than a black character area is present (see column 30, lines 59-65 and columns 31-32, lines 65-13).

In reference to claim 11, Mutoh et al. and Ng disclose all of the claim limitations as applied to claim 6 above, in addition, Mutoh et al. discloses a color feature amount extraction circuit (#121 of Figure 19) utilizing the second plurality of pixel data, along with a first and third plurality of pixel data, to produce a maximum value calculation (see columns 29-30, lines 63-12).

In reference to claim 12, Mutoh et al. and Ng disclose all of the claim limitations as applied to claim 6 above, in addition, Mutoh et al. discloses receiving a third plurality of pixel data (pixel data for color component Y) from the line memories (see column 29, lines 51-60). Mutoh et al. discloses a color feature amount extraction circuit (#121 of Figure 19) utilizing the third plurality of pixel data, along with a first and second plurality of pixel data, to produce a maximum value calculation (see columns 29-30, lines 63-12). Mutoh et al. further discloses testing the maximum value against a threshold maximum value, the result further helps in deciding whether a black character area or an area other than a black character area is present (see column 31, lines 6-13 and columns 31-32, lines 65-13).

In reference to claim 13, Mutoh et al. and Ng disclose all of the claim limitations as applied to claim 12 above, in addition, Mutoh et al. discloses a color feature amount extraction circuit (#121 of Figure 19) utilizing the third plurality of pixel data, along with a first and second plurality of pixel data, to produce a maximum value calculation (see columns 29-30, lines 63-12).

In reference to claim 14, claim 14 is equivalent in scope to claim 1 and therefore is rejected under similar rationale. Further, the office interprets the color judgment circuit to be functionally equivalent to the converter of claim 14 and the density difference sum calculation functionally equivalent to the separator module of applicant's claim 14.

Response to Arguments

2. Claims 4, 5, 9, 10, 17 and 18 were objected to and indicated that they would be allowable if rewritten in independent form. Claims 4, 5, 9, 10, 17 and 18 have been rewritten in independent form and include all limitations of the base claim and any intervening claims.

3. Applicant's arguments filed 03/11/05 have been fully considered but they are not persuasive.

In reference to claims 1, 6 and 14, Applicant has amended the claims to include the limitation of pixels utilized in calculating spatial gradient are pixel values of adjacent pixels, "...along the pixel line segment," (claim 1) and "...within the pixel line segment," (claims 6 and 14). Applicant then argues that neither the Mutoh or Ng references explicitly teach such a feature (see pages 10-11 of Applicant's Remarks). Applicant further goes on to indicate why Mutoh or Ng do not explicitly disclose this limitation by citing specific passages from these

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references. In particular, the Applicant believes that since Mutoh discloses the pixels used in detection calculations are located centered about a target pixel, that Mutoh does not teach the above limitation of including pixels, “along” or “within” the pixel line segment (see page 11, last paragraph of Applicant’s Remarks). The Office disagrees and broadly interprets the pixels used in the horizontal direction (see Figure 30(a) of Mutoh) equivalent to, “...pixel values of adjacent pixels along [within] the pixel line segment,” because such pixels are aligned in the same row as the target pixel. These pixel are in fact in the same row as the target pixel and therefore are inherently in the same line segment. Therefore, the Office maintains its rejection based upon Mutoh and Ng in view of the newly added limitation and interpretation of the Mutoh reference.

Allowable Subject Matter

4. Claims 4, 5, 9, 10, 17 and 18 are allowed.

In reference to claims 4, 9 and 17, the prior art of record (Mutoh et al. (U.S. Patent 6,631,210 B1), Ng (U.S. Patent 5,502,793), Zhu (U.S. Patent 6,195,459 B1), Otsu et al. (U.S. Patent 6,466,693 B1), Danisewicz (U.S. Patent 6,233,353 B1) and Li et al. (U.S. Patent 6,529,629 B2)) does not explicitly disclose squaring each of the spatial gradients to generate a plurality of squared gradients and generating the first statistical characteristic by summing the squared gradients.

In reference to claims 5, 10 and 18, the prior art of record (Mutoh et al. (U.S. Patent 6,631,210 B1), Ng (U.S. Patent 5,502,793), Zhu (U.S. Patent 6,195,459 B1), Otsu et al. (U.S. Patent 6,466,693 B1), Danisewicz (U.S. Patent 6,233,353 B1) and Li et al. (U.S. Patent 6,529,629 B2)) does not explicitly disclose generating a plurality of absolute gradients by

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determining an absolute value of each of the spatial gradients, determining a sum value by summing the absolute gradients and generating the second statistical characteristic by squaring the sum value.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Antonio Caschera whose telephone number is (571) 272-7781. The examiner can normally be reached Monday-Thursday and alternate Fridays between 7:30 AM and 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella, can be reached at (571) 272-7778.

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Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

aac

6/15/05



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